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FEBRUARY 24, 1879.

ON RANDITE.

BY THEODORE D. RAND.

At the December meeting of the Mineralogical Section, Mr. Goldsmith made a communication in regard to the uranium-yellow coating found at the south end of the largest quarry at Frankford, northeast of Adams Street, stating that he found in it, carbonic acid, silicic acid, phosphoric acid, uranium, alumina and lime; and that his conclusion was, that it was a mixture of autunnite and calcite. The writer stated at the same meeting that he had made an incomplete examination of the same mineral, which, in great part, confirmed Dr. Goldsmith's observations, but that he failed to find phosphoric acid, and promised the Section the result of experiments then under way.

At the meeting of the Academy held December 31st, 1878, Dr. Koenig communicated the results of a full quantitative analysis, giving the composition, a hydrous carbonate of uranium and lime, to which he gave the name Randite.

The writer's results differ somewhat from those of Mr. Goldsmith and Dr. Koenig. Owing to the very small amount of the coating, and its close adhesion to the rock, proper separation was impossible, and the first experiments were made by treating the rock and coating, first with acetic acid, to remove calcite, then with dilute hydrochloric acid. The coating was unaffected by the acetic acid, as proven by one specimen, in which, after solution of a large amount of calcite, the Randite was left in tufts of acicular crystals. The acetic solution contained chiefly lime, with a little alumina, but no uranium.

The hydrochloric solution yielded a small amount of silica, alumina, sulphuric acid, and phosphoric acid, with a large amount of lime and uranium.

In the treatment with acetic acid, bubbles appeared to rise from the coating—a multitude of tiny bubbles; on the succeeding treatment with hydrochloric acid, the bubbles were much larger, and fewer in number, and appeared to rise from a carbonate in the crevices of the rock.

The proportion between the lime and uranium may be given as follows:

	Koenig.	Rand, 1.	Rand, 2.
Lime,	56	38	26
Uranium,	44	62	74

10.708 gm. of coated rock, after treatment with acetic acid, yielded to 8 p. c. hydrochloric acid, cold, in about five minutes (the coating having disappeared), .122. On evaporating the solution to dryness there was a residue less than .001 gm. The solution was precipitated by ammonia, in the presence of chloride of ammonium; the solution with oxalate of ammonia gave carbonate of lime, .0365. The precipitate treated with acetic acid dissolved wholly, except .001 of a white precipitate, which contained phosphoric acid, and was probably phosphate of alumina. The solution precipitated by phosphate of soda gave phos. uran., .0711 = U_2O_3 .0569.

		Per cent.
Uranic oxide,	.0569	46.71
Lime,	.0204	16.71
Phos. al?	.001	.89
Undetermined,		35.69
		<hr/> 100.

About 100 grams of the rock, free from the coating, were treated with acetic acid in excess. A large amount of lime was dissolved, and a trace of alumina. The residue, treated with hydrochloric acid, yielded a little silica, some alumina, and considerable lime.

I infer from these tests that the mineral has not the composition obtained by Dr. Koenig, and that further investigation is needed, if pure material can be obtained.